AMENDMENTS TO THE CLAIMS

Claims 1-9 (Cancelled).

Claim 10. (Currently Amended)

An electric field generator/modulator (EFGM) for patterning and generating electrically conducting and/or semiconducting structures in two or three dimensions in a composite matrix, wherein the matrix comprises one or more materials respectively provided in one or more spatially separate and homogenous material structures, wherein the materials in response to the supplied energy can undergo specific physical and/or chemical changes of state which cause transition from an electrically non-conducting state to an electrically conducting and/or semiconducting state and vice versa, or a change in the electrically conducting ability ~~conduction mode~~ of the material, wherein each material structure is made in the form of a thin layer, and wherein the electric field generator/modulator comprises:

a first electrode means with a plurality of parallel strip electrodes provided in a first plane;

a second electrode means with a plurality of parallel strip electrodes provided at a distance from the first electrode means and super-positioned thereto in a second plane parallel with the first plane such that the electrodes of the first and second electrode means mutually are substantially orthogonally oriented ~~in a matrix-like arrangement~~;

wherein the electrode means ~~over cross-connection devices~~ are connected with a controllable power supply; and

wherein a space between each electrode means is adapted to receive a thin-film material in a form of a discrete component or a continuous tape, which continuously or intermittently is fed through the space without touching the electrode means and with simultaneous positioning and alignment spaced apart from and between each electrode means in a plane substantially parallel thereto, whereby the electrically conducting and/or semiconducting structures are optionally generated according to a determined protocol and are generated by means of point, line and/or area potentials that are created between selected electrodes in the electrode means when the selected electrodes over the cross-connection devices are supplied with electric power.

Claim 11. (Currently Amended)

The electric field generator/modulator according to claim 10, wherein the electrodes in each <u>of the first and second</u> electrode means <u>are</u> ~~is~~ provided on or in surfaces of respective substrates facing each other.

Claim 12. (Previously Presented)

The electric field generator/modulator according to claim 11, wherein the strip electrodes are made as a part of the substrates and form conducting structures in the substrates.

Claim 13. (Previously Presented)

The electric field generator/modulator according to claim 10, wherein the distance between the electrode means is controllable depending on a thickness of the thin-film material.

Claim 14. (Currently Amended)

The electric field generator/modulator according to claim 10, wherein the electrodes in each electrode means are provided with a mutual distance between 0.1~~μm~~μm and 1.0~~μm~~μm.

Claim 15. (Currently Amended)

The electric field generator/modulator according to claim 10, wherein the electrodes in each electrode means are formed with substantially constant width of 0.1 ~~μm~~μm to 1.0 ~~μm~~μm.

Claim 16. (Currently Amended)

An apparatus for generating electrically conducting, semiconducting and/or non-conducting structures in two or three dimensions in a composite matrix, wherein the matrix comprises one or more materials respectively provided in one or more spatially separate and homogenous material structures, wherein the materials in response to the supplied energy can undergo specific physical and/or

chemical changes of state which cause transition from an electrically non-conducting state to an electrically conducting and/or semiconducting state and vice versa, or a change in the ~~conduction mode~~ electrically conducting ability of the material, wherein each material structure is made in the form of a thin layer, and wherein the apparatus comprises:

an electric field generator/modulator comprising:

a first electrode device having a plurality of parallel strip electrodes provided in a first plane;

a second electrode device having a plurality of parallel strip electrodes provided at a distance from the first electrode device and positioned thereto in a second plane parallel with the first plane such that the electrodes of the first and second electrode devices mutually are substantially orthogonally oriented ~~in a matrix-like arrangement~~;

a controllable power supply; and

cross-connection devices that connect the electrode devices with the controllable power supply, wherein a space between the electrode devices accommodates a thin-film material in a form of a discrete component or a continuous tape, and whereby the electrically conducting, semiconducting and/or non-conducting structures are generated by means of point, line and/or area potentials that are created between selected electrodes in the electrode device when the selected electrodes over the cross-connection devices are supplied with electric power.

Claim 17. (Previously Presented)

The apparatus according to claim 16, wherein the electrically conducting, semiconducting and/or non-conducting structures are optionally generated according to a determined protocol.

Claim 18. (Currently Amended)

The apparatus according to claim 17, wherein the electric field generator/modulator modulates the electric field in a plane substantially parallel with the thin layer and creates electrical point or line potentials by selective supply of voltage to the electrodes of the first and second electrode devices according to the determined protocol, and generates the electrically conducting, semiconducting, and/or non-conducting structures in response to the electrical point or line potentials.

Claim 19. (Currently Amended)

The apparatus according to claim 16, further comprising:

positioning and alignment rolls that feed the thin-film material continuously or intermittently into the space between the first and second electrode devices without touching the electrode devices and wherein the positioning and alignment rolls provide simultaneous positioning and alignment of the thin-film material

from and between each electrode device in a plane substantially parallel to each electrode device.

Claim 20. (Previously Presented)

The apparatus according to claim 16, further comprising:

laminating rolls that combine two or more layers of the thin-film material in a stacked configuration, such that the composite matrix formed by separate adjacent layers has electrically conducting, semiconducting, and/or non-conducting structures in three dimensions.

Claim 21. (Previously Presented)

The apparatus according to claim 20, wherein the stacked configuration is formed by a lamination of two or more self-supporting layers.

Claim 22. (Previously Presented)

The apparatus according to claim 16, further comprising:

a plurality of rolls, wherein each separate material layer in tape form is drawn from respective rolls;

alignment rolls that position and apply tension to each material layer tape; and

laminating rolls that laminates two or more material layer tapes in a stacked configuration, such that the composite matrix formed by separate adjacent layers

is provided with electrically conducting, semiconducting, and/or non-conducting structures in three dimensions.